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SCIENCE NEWS LETTER

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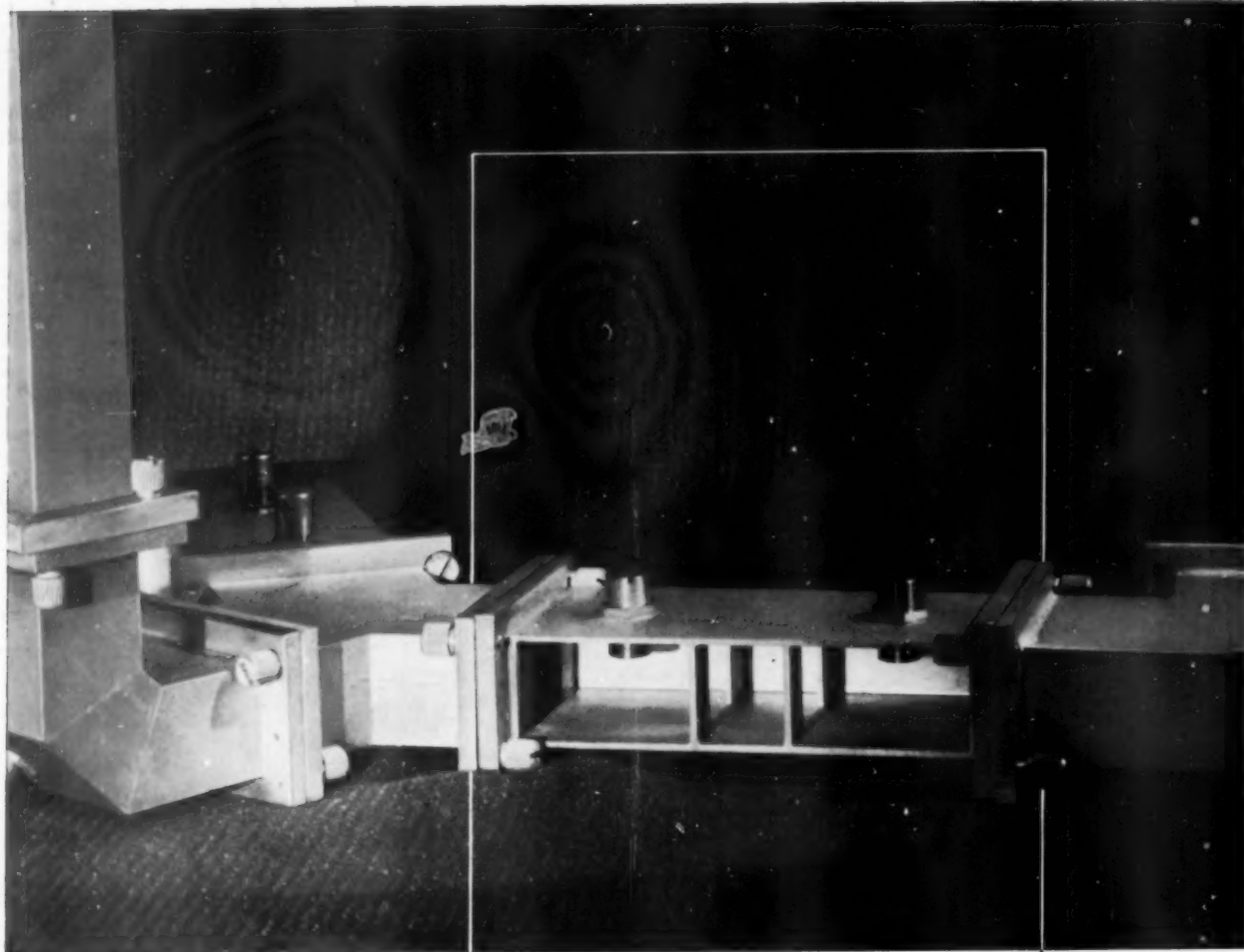
THE WEEKLY SUMMARY OF CURRENT SCIENCE • JUNE 14, 1947



Doughnut Landing

See Page 373

A SCIENCE SERVICE PUBLICATION



The two filters in the picture (one with side cut away) are used to separate two radio channels coming in on the same antenna but on different frequencies. At the end of the connecting waveguide, the channels are made to part company, each going to a different circuit through its assigned filter.

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SEPARATION CENTER FOR RADIO WAVES

Thirty years ago, when all telephone service went by wire, Bell scientists developed means of sending dozens of conversations over the same line.

This they did by giving to each conversation a different carrier frequency; then to separate it from the others, they used a device which they had invented and named—the electric wave filter.

Today, in microwave telephone systems, the message-bearing waves pass to and from the antenna in pipes called waveguides. So scientists in Bell Laboratories

devised a different kind of filter—a filter in a waveguide. This filter is a system of electrically resonant cavities formed by walls and partitions. Waves that set up sympathetic vibrations in the cavities pass through; others are reflected.

In the Bell System, now, single circuits are carrying many conversations at the same time through precision wave-filtering.



BELL TELEPHONE LABORATORIES

EXPLORING AND INVENTING, DEVISING AND PERFECTING, FOR CONTINUED IMPROVEMENTS AND ECONOMIES IN TELEPHONE SERVICE

GERIATRICS

Youth Fountain in Brain?

When groups of nerve cells in midbrain are injured by sickness, aging in appearance occurs. Scientists seek relation between disease and old age.

► SMALL MASSES of nerve cells in the midbrain may hold a clue to the Fountain of Youth. When these groups of nerve cells are injured by sickness, as in "sleeping sickness," a look of advanced old age comes even to quite young persons. Perhaps further study of these cells and of the effects of sickness on other cells in the body may lead to extending life to "unlimited periods."

These suggestions appear in a report by Dr. S. Philip Goodhart, professor of clinical neurology at Columbia University, to the American Geriatrics Society in Atlantic City.

For examples he drew from a study of a large group of patients in which the disease process was chiefly in the basal ganglia. These are the small masses of groups of nerve cells within the midbrain. They mediate important vital functions of the body. Among these are the mechanism of blood circulation, the action of the heart, digestion, and the walls of the arteries. Here, too, Dr. Goodhart pointed out, are the centers

closely integrated with the emotions. There is anatomical and physiological relationship between these cells and the higher controlling centers within the brain cortex.

Among the patients studied was a young woman, once graceful and comely. She emerged from an attack of epidemic encephalitis, or so-called sleeping sickness, as a much older woman with features changed and a face almost hideous in its expression. Her figure also had changed its contours.

Two other victims of this disease rapidly developed tremors and expressions of advanced age, "as though a few months had wrought the changes of years."

"Are the changes of advancing years from birth to old age expressions of disease?" Dr. Goodhart asked his medical audience. "Is there reason to look with hope that as Science develops means to prevent disease or builds up immunity, life may extend to unlimited periods?"

Science News Letter, June 14, 1947

MEDICINE

New Flu Vaccine for Army

A new strain of influenza virus appeared in the last epidemic and vaccine is being developed to protect against it. Promise of anti-flu drug seen.

THE ARMY will probably have a new, better vaccine against influenza next fall. And before too long, all of us may be able to get a specific drug for treatment if we get 'flu.

These possibilities appear in a report made by Dr. Joseph E. Smadel, scientific director of the virus and rickettsial diseases department at the Army Medical Center, Walter Reed Hospital.

Reason for the new influenza vaccine is that a new strain of influenza A virus appeared during the 1947 epidemic. It was so different from the older strains of influenza A that the present vaccine, in some cases at least, could not protect against it. The present vaccine is effective

against the older strain of influenza A and against a strain of influenza B virus.

The Army's epidemiological board has just recommended that the new strain be incorporated with the older strain and the B virus, in vaccine purchased by the Army for use in the fall of 1947.

For treatment of influenza, Dr. Smadel pointed to two drugs that check the growth of the virus when it is growing on eggs in the laboratory. One of these is an acridine, related to the anti-malaria drug, atabrine. Although the growth of the virus is considerably delayed at first, at the end of 72 hours it was growing as well in the acridine treated eggs as in untreated controls.



RAIL ROBOT—Powerful electric generator will feed 1,500 horsepower of energy to a diesel-electric locomotive's driving motors. In larger locomotives, two or more of these generators are operated together.

"Such data as these are not sufficiently exciting to warrant immediate clinical trials of this drug in the treatment of influenza," Dr. Smadel said. "The data do hold promise that a satisfactory drug may be found."

"Candy coating" the flu virus by such sugary materials as apple pectin and blood group A substances also checks its growth in eggs. This was reported last month by scientists of the Rockefeller Institute. The candy coated virus particles, Dr. Smadel explained, seem unable to enter the body cells to cause infection, while the acridine drug probably prevents virus growth by interfering with processes in the body cells essential for multiplication of the virus once it has gotten into them.

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PHYSICS

Oil Recovery from Wells

► TO SPEED the recovery of oil from sluggish wells, Ralph M. Steffen of North Hollywood, Calif., explodes carbonated gases in a cylinder, and pumps them down the well while still flaming hot. The heat reduces the viscosity of the oil, and the pressure substitutes for the lost natural gas pressure. Patent 2,421,528 was granted on this idea.

Science News Letter, June 14, 1947

MEDICINE

Blackouts Not Damaging

► PILOTS who "black-out" frequently during dive bombings or other combat flight maneuvers need not worry that they will suffer any lasting damage from the experience. Evidence for this reassurance comes from studies reported by Drs. E. H. Wood, E. H. Lambert and C. F. Code, of the Mayo Aero Medical Unit at the meeting in Atlantic City of the Aero Medical Association.

In the process of developing means of protecting pilots against blackout, many of the personnel of aero medical laboratories repeatedly acted as subjects during tests on the human centrifuge and in aircraft. They often lost vision, that is, had a "blackout," during such tests and sometimes were made unconscious and were out completely.

Up to the present, they have developed no apparent permanent or cumulative effects from these experiences, although they probably have experienced more blackouts than a fighter or dive bomber pilot or test pilot would experience in a lifetime.

Some of those who took part in the

tests have undergone more than a thousand 15-second exposures to centrifugal forces ranging from two and one-half to nine times the force of gravity.

Some were exposed to forces of over two and one-half times gravity for a total accumulated time of more than five hours and to forces above six times gravity for more than 40 minutes.

Some had partial or complete blackouts more than 800 times in the three-year period from 1942 to 1945.

The blood pressure at the level of the head was reduced in some of the test personnel, it is estimated, to less than half the normal on more than 300 occasions and to zero on more than 70 occasions.

Although these reductions in blood pressure lasted less than 15 seconds, one person had the experience often enough so that the total accumulated time at which his blood pressure was one-half of normal was more than 50 minutes. For an accumulated time of more than 15 minutes he had the blood pressure in his head reduced to zero.

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NUTRITION

Food Likes Important

► PILOTS and crews of combat planes want candy, chocolate, cigarettes and chewing gum for flight rations, regardless of what nutritionists think of such a diet. And the fliers want fried eggs for breakfast before taking off on their dangerous missions, even though scientific studies showed that cereal and toast for breakfast raises their ceiling 2000 feet.

These food likes, and their importance, were reported by Dr. David B. Dill, scientific director of the Army Chemical Center's medical division, at the meeting in Atlantic City of the Aero Medical Association.

War dogs in action on Moretai ate, thrived and carried out their missions with great success on an old C ration type of diet, consisting solely of meat and vegetable stew and hash. But soldiers and air men refused these rations after a few days, even when there was nothing else to eat.

Which goes to show, Dr. Dill stressed, that a good ration for a soldier cannot be planned on the basis of feeding ex-

periments with animals in a laboratory.

Quartermaster Corps scientists planning rations for any future wars might well follow the example of "that unsurpassed observer of soldiers in action, Ernie Pyle," Dr. Dill suggested, and get out in the field to see what combat soldiers want to eat.

"A few observations on men under combat conditions may be more valuable," he said, "than hundreds of observations on test subjects who have not been at war or thousands of observations on rats."

Planning civilian diets for good nutrition, he suggested, also will be more successful if made on men at work as well as on rats in the laboratory.

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MEDICINE

Less Proficiency Causes Plane Accidents in Pairs

► AIRCRAFT accidents do come in pairs, if not in threes, Dr. Daniel Horn, of the flying safety division of the Field

Office of the Air Inspector, Langley Field, reported at the meeting in Atlantic City of the Aero Medical Association.

There is nothing mysterious about the repeated accidents. An accident is followed by a period when the pilot's proficiency is temporarily impaired, it seems from Dr. Horn's studies. These concerned the time interval between successive aircraft accidents for over 9,000 repeater pilots in the AAF.

The study showed that a second accident tends to follow quickly on the heels of the first, whether or not pilot error was involved in the first accident.

The old flying custom of sending a man up again as soon as possible after he has crashed would seem to need revision on the basis of these studies.

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FOOD TECHNOLOGY

Soybean Protein Whipped

Extracted after oil has been removed, these proteins make excellent whipping compounds. Other reports from the Institute of Food Technology are given.

►THE SOYBEAN, versatile gift of Orient to Occident, has found yet another job in its adopted home in the West. Soybean proteins, extracted after the oil has been taken out, make superior whipping compounds, Dr. Ralph M. Bohn, Minneapolis food chemist, stated before the meeting of the Institute of Food Technologists in Boston. Whipping compounds include such things as meringues, marshmallows, nougats, and other kinds of "sweetened air" that play highly important roles in the pastry and confectionery trades. The new soybean products will capture more air quicker and hold it longer than either egg white or gelatin, the speaker pointed out.

Storing Dried Egg White

Dried egg white, used by tons in making baked goods, tends to deteriorate in storage because it contains a certain amount of sugar, John C. Ayres and George F. Stewart of Iowa State College told the meeting. This undesirable sugar can be eliminated by fermentation with ordinary yeast, which is added along with a small quantity of yeast extract. By careful control of the fermentation process, the substance called mucin, essential for good results with egg white, can be retained.

Research on Packaging

Packaged food products can be kept from spoiling longer by treating the wrapping material, or even the paper-pulp out of which it is made, with fungicides, antibiotics and antioxidants, according to the requirements of the particular product, Dr. Louis C. Barail of the U. S. Testing Company, Hoboken, N. J., stated. He regards as ideal a group of new synthetic wrapping plastics known collectively as Vyncote, because they are "inert, non-toxic, tasteless, non-inflammable, and capable of being treated with germicides, fungicides and insecticides."

Fish Byproduct Uses

Non-edible byproducts of fish have a wide range of industrial and other uses, Dr. H. L. A. Tarr of the Fisheries Research Board of Canada told the meeting. Uses in such things as fertilizer and chicken-feed are so well known as to be commonplace; less familiar, perhaps, is their usefulness to makers of linoleum and plastics, as well as in leather preparation. Vitamins from fish livers are an old story, but the pharmaceutical industry is also drawing on fish for insulin, the protamin used with insulin, and the anti-pernicious anemia factor.

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MEDICINE

Adrenal Glands Found To Produce Fat Hormone

►DISCOVERY of a new fat hormone produced by the adrenal glands was announced at the meeting in Atlantic City by Drs. Frank A. Hartman, Katherine A. Brownell and Jonathan S. Thatcher of Ohio State University.

The adrenal glands, located just above the kidneys, are most familiar to the layman through another of their hor-

mones, adrenalin or epinephrine, sometimes dramatically used as a stimulant to dying patients and also commonly used to relieve acute asthma attacks.

Besides adrenalin, these small glands produce at least one other vital hormone, a chemical generally referred to as cortin. Lack of this hormone results in Addison's disease in which the patient's skin is a gray-bronze color and which was always fatal until the discovery of cortin.

The new fat hormone from these same glands is responsible for moving fat from the reserves of the liver during starvation, the Ohio State scientists found. When given to laboratory animals from which the adrenal glands had been removed, it caused fat to be deposited in their livers even when they were starving.

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AERONAUTICS

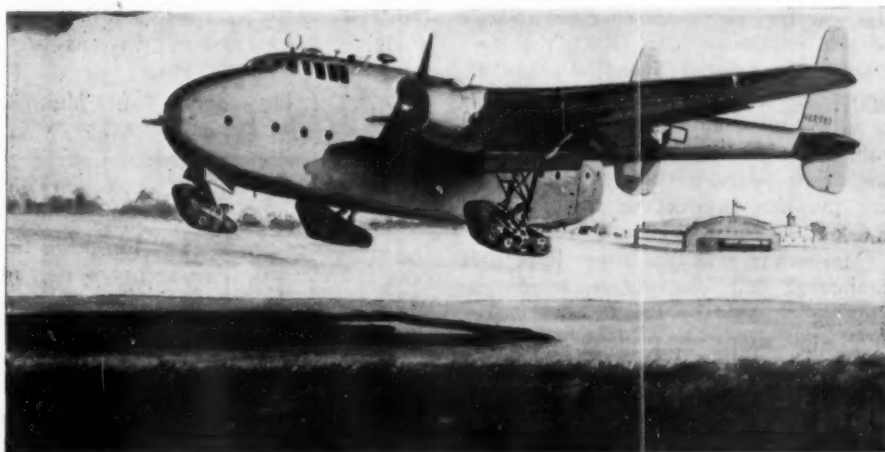
Inflated "Doughnuts" Make Landing on Water Possible

See Front Cover

►HELICOPTERS can now land on water or marshy ground by means of newly developed landing gears attached to each of the three landing wheels. Tests made by the U. S. Coast Guard at Elizabeth City, N. C., showed these gears that are really rubber lifeboats to be satisfactory. They look somewhat awkward when blown up but do not interfere with normal landing on ground.

If a helicopter engine should fail over water the flotation gear would make possible a landing instead of a crash.

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TRACK LANDING GEAR—This landing gear, similar to the tractor tread used on tractors and tanks, is being built for the Fairchild C-82 Packet.

RADIO

Printed Wire for Radios

Commercial application of this wartime research is about to become a reality. Flat lines for easy production are development from proximity fuze.

► FIRST COMMERCIAL application of the revolutionary wartime development, printed wire, may soon find its way into new radios.

The flat, printed lines, which take the place of the complicated copper wires in your own radio, are now being used to form small, rugged interstage coupling plates. These plates connect the amplifying tubes of a radio.

Printed wire plates are being manufactured by the Centralab division of Globe-Union, Inc., Milwaukee, Wis. This firm produced printed wire circuits for the proximity fuze. At least one large radio manufacturer is understood to be planning to use the printed wire plates in home radios.

Claimed to be the first commercial application of printed wire, the coupling plates have only four soldering connections, compared with nine in standard wiring, and are smaller units, more easily incorporated in radios.

Printed wire is formed on a flat surface with a solution which dries to form lines. These lines are composed of silver in place of copper wires, and carbon is used for resistors in printed wire electronic circuits. Advantages claimed for printed wire are rapid, comparatively easy production, smallness of size and rugged construction, compared with wiring.

Printed wire was developed late in the war for use in some of the models of the proximity fuze. Since the war, scientists at the National Bureau of Standards have developed the "lipstick broadcasting station," the "calling card radio" and other tiny equipment utilizing printed wire, but the coupling plates are the first product to come on the market.

Meanwhile, scientists at the Bureau of Standards fear that America may be lagging behind the British in developing applications of printed wire. Sargrove, Ltd., of London, is reported to have produced an assembly-line type machine for turning out printed wire circuits.

Latest American achievement with printed wire is a complete radio transmitter smaller than a pack of cigarettes.

The broadcasting unit is seven-eighths of an inch by two inches by two and one-fourth inches. The tiny radio station was developed by Dr. Clelio Brunetti and his associates in the Ordnance Development Division of the Bureau of Standards.

Two-thirds of the midget station's size is due to batteries. Dr. Brunetti predicts even smaller batteries may be developed. The lipstick broadcasting unit, developed by Dr. Brunetti's group, had lines painted on the tube to replace wires, but it required separate batteries.

Dr. Brunetti reports that his office has received many reports from manufacturers working on printed wire developments. After components for radios, such as the coupling plates, he believes a personal radio with a broadcasting and receiving station, small enough for a coat pocket or handbag, will be put on the market.

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EVOLUTION

Man Owes Civilization To Adaptability of Mind

► MAN IS MAN because he is plastic—mentally.

Man owes his distinctive place in the world, his separation from all his animal kindred, to his inheritance of an adaptive mental pattern. Human beings do not have to respond to a situation in a rigidly predetermined way, as bees, wasps and ants do.

Dr. Th. Dobzhansky of Columbia University and Dr. M. F. Ashley Montagu of Hahnemann Medical College in Philadelphia explain this plasticity in human behavior in *Science* (June 6).

Man solves problems of life never before experienced. This ability is tied in with man's highly developed nervous system, and especially with his big brain. Organisms with "one-track" behavior patterns have far less complex nervous systems, the two scientists state.

Big brains came early in human development. Beetle-browed Neanderthal man had a brain somewhat larger than modern man's, though differently shaped.

But more important than size or shape of brain is what can be done with this equipment. The two scientists point to the well-worked flint tools of half a million years ago which are specialized types intended for different jobs. They are evidence that the distinctively human trait of mental plasticity had already been well developed.

The scientists see no reason in man's evolution why various human races can't think the same way.

Just because different races have different skin colors and other structural traits that are not the same, Drs. Dobzhansky and Montagu contend that "it does not necessarily follow that they must also differ in mental ones."

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METEOROLOGY

Radio Waves to Give Facts About Air Masses Overhead

► RADIO WAVES may some day become probes used by weathermen in finding out what kinds of air masses are overhead and roundabout. From knowledge thus gained, they may be able to give more accurate forecasts of what's coming up next.

Newest thing in this field is the subject of U. S. patent 2,421,730, issued to Gilbert S. Wickizer of Riverhead, N. Y., and assigned by him to the Radio Corporation of America. Mr. Wickizer uses radio waves of high frequency—300,000 kilocycles and upward—sending them from stations at known distances apart, with the receiving station on a tall tower or even on a mountain.

High-frequency radio waves, of the so-called pseudo-optical group, are affected in their range primarily by the refractive qualities of the lower atmosphere, just as visible light waves are. Therefore by studying their signal strength on reception, Mr. Wickizer states, it will be possible to obtain data on the relative humidity, temperature and pressure gradients of the intervening air masses.

Some work in this field was done experimentally during the war by Army aerologists, but not all of their results have yet been made public.

Studies on the relations between lower-frequency radio waves and meteorological conditions have been under way for several years at the Blue Hill observatory of Harvard University, under the direction of Dr. Harlan T. Stetson.

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MEDICINE

Relief for Polio Symptoms

Local anesthetic injected into nerves along the spinal column improves the condition of clammy, swollen feet and hands of adult patients.

► A NEW, SUCCESSFUL treatment for some symptoms of infantile paralysis is announced by three Army medical officers at the Army and Navy General Hospital at Hot Springs, Ark. The officers are Maj. Vincent J. Collins, Lieut. William L. Foster and Capt. William J. West.

The treatment is not a cure for polio. It was devised to relieve the blue, cold, clammy and swollen feet and hands of grownup patients recovering from infantile paralysis. Infantile paralysis, they point out, can no longer be considered unusual in grown persons. They quote one authority as stating that the number of cases in grownups is definitely increasing. At the Hot Springs Army and Navy Hospital, a center for poliomyelitis patients, 131 cases in military personnel were studied.

Muscle spasm and tenderness were also relieved by the new treatment, although it was not devised for this purpose. The finding that it relieved muscle spasm was unexpected, but the relief was so definite and sharp that the Army doctors suggest using the treatment also in the acute stage of the disease. One patient got relief although treatment with hot packs had brought only "mild comfort."

The treatment consists of injections of a local anesthetic solution into nerves along the spinal column. The procedure is known technically as paravertebral sympathetic block. It is not unlike the nerve-cutting operation used in some cases of high blood pressure and which has also been used in some cases of infantile paralysis. But the Army doctors use a chemical, the anesthetic solution, to cut the nerve connections.

The nerves selected are those which control contraction and dilation of the small blood vessels in the arm or foot affected with chilblains and the other symptoms. Apparently these nerves are affected by infantile paralysis, although the amount of paralysis does not run parallel to the effect on the blood vessels. When the nerves controlling the blood vessels are affected, blood circulation is poor and the feet or hands get cold, clammy, blue and swollen.

The change in circulation usually occurs within five or 10 minutes after the chemical is injected. Many patients experienced a "hot foot" and said, "I can't remember when my foot felt so good."

One patient with weakness, tenderness and spasm of the biceps and triceps muscle of his right arm said after the treatment, "My right arm is now better than my left."

The dropsy swelling cleared up slowly in all cases. Three patients, however, said that on the day following the nerve block treatments they could get into a slipper easily.

Patients have continued to be relieved of the poor circulation symptoms for as long as six months after the treatment. If they have a severe relapse, the treatment can be given again.

The treatment could also be given to children, the Army doctors believe, although it would be more difficult because it is necessary to have complete cooperation of the patient to do the block successfully.

Details of the new treatment are reported in the *New England Journal of Medicine* (May 8).

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ENGINEERING

New Auto Engine Uses One-Third Less Gasoline

► ONE-THIRD less gasoline is used by a new automobile engine than in present types, it was revealed to the Society of Automotive Engineers by Charles F. Kettering, research chief of General Motors. Its installation in cars will keep step with the development of new fuels.

It is a high-compression engine, with cylinder pressure reaching 1,200 pounds per square inch. Present engines run at only 600 pounds per square inch. Automobiles with the new high-compression engines, operating since last November, are giving 33% to 40% higher economy than ordinary automobile power plants.



FIRE STOP—Gases and fumes from fires are sucked out through ducts, such as the one the operator is adjusting, by an exhaust fan. Sprinklers surround the ducts to cool the air and help block passage of smoke into the stair opening.

But these high-compression engines and fuel developments are in the laboratory stage, he said. How soon they can be incorporated into the automobile will depend upon a large amount of development by both the automobile and the petroleum industries working together toward a common goal. Doubling the compression ratio at one jump cannot be made at once for various reasons. There are 30,000,000 vehicles on the road today which do not require high octane gasoline and must be kept running until they wear out.

The change-over from present engines to very high compression engines can be taken only in steps. As the petroleum industry makes an improvement in fuels the automobile industry can supply a higher compression engine to utilize them.

The new engine is designed according to rather conventional procedures, Mr. Kettering said, except that it is rigid enough to carry the higher loads imposed. It weighs no more per horsepower than present stock engines. Its compression ratio, 12.5 to one, was chosen because tests with a one-cylinder experimental engine showed that most of the gains in efficiency on this cylinder construction could be obtained at this ratio.

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PLANT PHYSIOLOGY

Opposed Growth-Control Chemicals in Sugarcane

► **THERE IS** in sugarcane, and apparently in other plants as well, a substance that checks growth as well as a substance that speeds growth. Plants thus seem to be in the same situation as Alice in Wonderland, who, it will be recalled, made herself taller by nibbling one side of a mushroom, and shorter by nibbling the other side.

Existence of this pair of opposed growth-control substances has been demonstrated by two botanists at the University of Hawaii, Dr. Charles J. Engard and Avaro H. Nakata, who succeeded in extracting them separately by exceedingly careful differential methods. They tested their effects on oat seedlings, which are the plant physiologist's guinea-pigs for growth-control compounds. Existence of anti-growth as well as growth hormones had been indicated in several earlier researches; the present work definitely establishes the fact.

Presumably the growth-inhibiting substance or substances function in establishing a plant's natural size and proportions. As a practical matter, hereafter it will be necessary for experimenters to seek out and separate both kinds of substance, where in the past the discovery of a growth-promoting substance only has been considered sufficient.

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MEDICINE

Rough Motion, Not Mind, Causes Plane Sickness

► **IF YOU GET** airsick, it is because the air is rough, not because you are frightened about flying or expecting to be sick.

Psychological factors may play some part, but not as much as has been claimed for them.

This debunking of psychological factors in air or motion sickness came from a professor of psychology, Dr. G. R. Wendt, of the University of Rochester, to the Aero Medical Association meeting in Atlantic City.

The character of the motion has a lot to do with whether a person will get sick, Dr. Wendt found from studies of persons in an elevator-like cab that was moved up and down in "waves" of different sizes, frequency, form and acceleration.

A 32-cycle wave that was really "rough" and which the people in the

cab expected would make them sick did not cause sickness in as many as a 22-cycle wave. This was one unexpected finding and one which tended to debunk the psychological factors.

The posture of the head had an effect on motion sickness, as did certain drugs.

"The view that airsickness is 'all psychological' is a defeatist position," Dr. Wendt charged. He said that a strong effort should be made to disseminate the evidence that the kind of motion and the state of the body are more important than the state of mind in causing air sickness.

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NUCLEAR PHYSICS

Heart of Atom Holds Three Science Mysteries

► **THE HEART** of the atom and its great energy hold three major mysteries for scientists these days. They are:

1. What holds together the protons and neutrons in the atomic nucleus? (Protons are positively charged and should repel one another.)

2. Why are electrons or electrical particles ejected from the atomic heart which does not contain them?

3. Just what is the meson or mesotron? (This particle discovered in cosmic ray studies lives only a few millionths of a second and then probably reverts to an ordinary electron.)

Giant high voltage machines are being built to solve these atomic secrets, Dr. G. W. Dunlap, General Electric nucleonics engineer, explained in listing the atomic problems.

One of the six kinds of these machines, the synchrotron, will produce energies running into billions of electron volts (an ordinary X-ray machine used in doctor's offices uses a few thousand volts.) One synchrotron proposed will reach ten billion.

Other atom smashers are: Betatron which accelerates electrons to produce high-energy X-rays. Cyclotron, best known among atom smashers, which is a sort of merry-go-round for atomic particles. Synchro-cyclotron, which can produce almost unlimited energies by applying frequency modulation principles to the input. Linear accelerator, which is an "unrolled cyclotron" and for very high voltage could be 100 feet or more long. Electrostatic accelerator, also known as the Van de Graaff machine, the pioneer atom-smasher.

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IN SCIENCE

ICHTHYOLOGY

Parasitic Protozoan Causes Fish Disease

► **A NEW** and serious disease that spoils many fish intended for South African markets, and which can be detected by a ghostly glow given off by infected specimens under ultraviolet light, has been studied by Rees Davies and E. Beyers of the Low Temperature Laboratory in Cape Town, South Africa. Causal organism is a parasitic protozoan, a microscopic one-celled animal that gets into the muscle fibers of the fish and makes the flesh soft and inedible.

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AERONAUTICS

Duplex Planes for Cargo And Passengers Discussed

► **AIR TRANSPORTATION** now has growing pains similar to those of railroad traffic decades ago. The question is: Should passenger planes carry mail, express and freight, or should this "dead" material be hauled exclusively in cargo craft?

Established airlines can handle passengers, mail, express and freight with efficiency and safety, the Society of Automotive Engineers was told by Charles P. Graddick, of United Airlines, Chicago. This combined traffic would justify the operation of more daily flights, and thereby provide air transportation service otherwise not available to smaller communities.

Separate planes for cargo would constitute unnecessary duplication, making traffic and management problems more complicated.

"The airlines," he said, "are perfecting interchange arrangements which will permit patrons to ship over any combination of air routes . . . between any two points in the United States."

Airplane service is not comparable with that of truck and bus lines. These offer service that can not be duplicated by the railroads. Trucks can be loaded anywhere in a city, and unloaded directly at stores or warehouses in other cities. They are not confined to fixed terminals as are both railroads and airplanes.

Science News Letter, June 14, 1947

CE FIELDS

MEDICINE

Will It Be Boy or Girl Answered By New Tests

► PROSPECTIVE parents wondering whether the expected baby will be a boy or a girl no longer need wait nine months for the answer.

Some of them will be able to get it much sooner by two new tests announced at the meeting of the Association for the Study of Internal Secretions. The tests were developed by Drs. H. E. Nieburgs, H. S. Kupperman and R. B. Greenblatt of the University of Georgia School of Medicine.

One of them is a chemical test made on the expectant mother's blood. The test is for the ratio between two kinds of hormones, chemicals produced by the pituitary gland at the base of the brain, which affect the sex glands. One is called FSH hormone, the other LH hormone. When the expected baby is going to be a boy, the amount of LH is greatly increased in proportion to the amount of FSH in the mother's blood, the Georgia scientists find.

The second test is made by staining and studying through a microscope the cells shed by the tissues lining the opening to the uterus, or womb. In some cases there are definite types or patterns of these cells. Where the types are definite, the Georgia doctors can tell with 85.4% accuracy whether the baby will be a boy or a girl. Where the types are not definite, no predictions as to sex can be made.

Science News Letter, June 14, 1947

PLANT PHYSIOLOGY

Chemical Tests Seeds For Ability to Sprout

► SEEDS CAN be tested for their ability to sprout by a new chemical method in a tenth of the time required by the old-time germination test. The new method, which was further developed in Britain, and is described in *Nature* (May 31) by H. J. Cottrell of the research laboratories of May and Baker, Ltd.

Chemicals belonging to the group known as tetrazolium salts are used in the test. They form colorless solutions in water, but when acted upon by the

enzymes that are present in germinating seeds change into insoluble red dyes.

Representative samples of seeds to be tested are first soaked overnight in water, then split lengthwise so as to expose the embryo or growing point. One half of each seed is then placed in a shallow glass dish and just covered with the colorless tetrazolium solution. They are left in the dark, at moderately warm temperature, for four hours. At the end of that time, seeds of good viability will be stained bright red in the region of their growing parts. The area stained differs, of course, from species to species, but any good botanist or agronomist will know where the red should show up if the seed is good.

Science News Letter, June 14, 1947

OCEANOGRAPHY

Corals and Algae Build Atolls Very Slowly

► ATOLLS like Bikini are built up by the corals and algae that form them at a rate not more than one-tenth of an inch a year, state Dr. M. C. Sargent of the Scripps Institution of Oceanography and T. S. Austin of the Navy's Hydrographic Office.

A chemical test shows whether an atoll is growing or on the downgrade, they add. High oxygen content in the water shows that organisms are being born; high phosphorus content indicates decay.

Science News Letter, June 14, 1947

ENGINEERING

Reversing Gas Turbine For Ship Propulsion

► A REVERSING gas turbine in which the flow and temperature of the driving gases do not fluctuate during reversal is offered by C. R. Waller of Trenton, N. J., for patent 2,421,445. It is claimed to be peculiarly well adapted for use in ship propulsion. Patent rights are assigned to the De Laval Steam Turbine Company.

The principle involved is very simple. Driving gases are supplied through a ring of nozzles set at an appropriate angle for forward motion. There is a second ring, with nozzles pointed at an opposite angle. Both rings are movable; so to reverse, the "forward" nozzles are pushed out of the way, and at the same time the "reverse" nozzles are brought to bear. The turbine operates at lower efficiency in reverse, but that is a matter of relatively minor importance.

Science News Letter, June 14, 1947

MEDICINE

Alcohol Controls Allergy Of House Ivy Poisoning

► SOMETHING different in the way of ivy poisoning came in for discussion at the meeting in Atlantic City of the American College of Allergists.

This is skin trouble from house ivy, the plant housewives keep growing in pots or in ornamental jars of water to decorate the living room or sun porch. Fortunately, it is a rare condition, not many persons being sensitive, or allergic, to this plant.

One case was successfully controlled by treatment with an alcoholic extract made from the house ivy leaves, Dr. Samuel E. Rynes of Philadelphia reported.

The extract, of course, was given by hypodermic injections under the skin, as hay fever victims are desensitized to pollen by injections of pollen extracts.

Science News Letter, June 14, 1947

INDUSTRY

Byproducts Can Cut Cost Of Manufactured Gas

► MANUFACTURED gas for cities in the northeastern quarter of the nation may cost less in the future, Alfred R. Powell of Koppers Company, Inc., Pittsburgh, told the Production and Chemical Committee Conference of the American Gas Institute.

Biggest hope for lower gas costs in areas where gas is made from soft coal is from new byproducts and new uses for products obtained in the manufacture of gas. The value of the byproducts in making gas from coal is already greater than the return from sale of the gas. New uses and new byproducts are the best bet for smaller gas bills, Mr. Powell declared.

Other factors which can cut the cost of manufactured gas include increased capacity of present equipment for producing gas; greater heat efficiency from present methods; and cheaper plant construction.

Complete gasification of coal, by processes developed in Germany and elsewhere, is not satisfactory for city gas, Mr. Powell warned. He said the processes were planned for special gases and more research will be needed to determine the real value of complete gasification of coal.

Science News Letter, June 14, 1947

PHYSICS

Atomic Age Alarm

Clicks of the Geiger counter sound warning of radioactivity. A metallic tube is the heart of this defense against atomic radiations.

By **RON ROSS**

► **CLICK . . . click . . . click, click, click, click—faster and faster, an ominous signal is heard.**

The atomic alarm has sounded. It can be a warning, in time, against atomic bombs. Or the death rattle of our civilization.

Harsh, staccato noise emitted from an electronic device that scientists call a Geiger counter. It clicks out its warning of radiation, such as that emitted from radium, or more pertinently from the mother stuff of atomic bombs, uranium. Whenever dangerous radioactivity is sprayed out in radiations—X-ray-like gamma rays, alpha particles which are helium hearts, beta rays which are fleet electrons—the Geiger counter clicks.

Mechanical Policemen

Tomorrow, in a world deadly fearful of illicit atomic bombs or atomic materials, Geiger counters will be the un-sleeping mechanical policemen of the atomic age.

You may not read about it, but the chances are that every passenger who steps off an international airplane or debarks from a transoceanic steamer will be given the once-over with a Geiger counter.

At the gateways to our public institutions, at the freight and package entrances to our critical and important offices, these warning devices will be on guard.

Patrolling airplanes will carry them routinely to chart any unusual activity in the upper air. The alarm could be sounded if a radioactive gas attack seemed approaching. At critical and important places, such as 42nd and Broadway and atop Golden Gate Bridge, the counters will be on watch.

Just as radar will constantly scan our frontiers for incoming ships by air and sea, so the detectors of radioactivity will be a part of the nation's defense.

The difference between life and death in the future may be a metallic tube.

This tube is the heart of the Geiger counter. Tell-tale radiations from uranium, plutonium or other radioactive materials sound the atomic alarm when they strike the remarkable tube of the Geiger counter.

These rays cannot be seen with our eyes and are not felt by our bodies. Most powerful ray from atomic bomb material is the gamma ray. This is a sort of short-wave X-ray. It is only one tenth as long as the shortest X-ray but usually many times as powerful.

Beta rays are high speed electrons, the negatively charged particles which are a part of all atoms. They are not so penetrating as gamma rays but are more powerful than alpha rays, which are composed of "stripped" helium atoms.

Hiding, or shielding, the rays of uranium from the tube of the Geiger counter would require huge amounts of lead for even a small bit of material. Sneaking an atomic bomb or its materials into an area guarded by the counter will be difficult, if not impossible.

The Geiger counter was first developed

nearly 40 years ago by a German professor, Hans Geiger, and the famous English physicist, Lord Rutherford. Later, Geiger and a German colleague, W. Mueller, improved the counter so that it could count large numbers of particles in a short time. The instrument is formally known as the Geiger-Mueller counter.

The counter is a million times more sensitive than most of the devices in scientific laboratories. It measures the ultimate particles of matter. A single particle of an atom triggers a click from the counter. Yet, this sensitive instrument is amazingly simple.

Balance in Tube

A delicate electrical balance is set up inside a tube. When a bit of an atom, a ray given off from uranium or other radioactive material, penetrates the thin wall of the tube, it upsets this balance. An electrical charge is given off. This charge becomes a click for each ray entering the tube.

The metallic tube may be of many different sizes. Scientists at the National Bureau of Standards have developed a hypodermic needle type of counter tube. This is hardly bigger than a small needle and is used for radioactive tracer work. A novel counter was built from an empty tooth paste tube. More common types of counter use metal tubes an inch or more in diameter. The tube may be enclosed in glass or have a glass window.

The thickness of the wall of the tube is important. This determines which rays will be detected by the counter. For spotting radioactive material, a metal tube which may block alpha and beta rays can be used. To detect uranium, a gamma ray counter is sufficient. These powerful rays can warn of radioactivity without help from beta and alpha radiations.

Inside the tube of the Geiger counter is a wire running the length of the tube. The wire connects insulating disks which seal the ends of the tube. The tube contains a gas at low pressure.

High voltage is applied to establish a strong electrical field between the wire and the tube. The voltage is high enough so that the gas is just ready to "break down." This establishes a delicate electrical balance.

The balance is broken by a ray pene-



COUNTER TUBES—Each of these, used in Geiger counters, has a different ray-detecting job.

trating the tube. The penetrating ray rips the gas molecules and frees charged particles, called ions. This produces an electrical discharge.

When the discharge is amplified by the Geiger counter, you hear a click. Each time a ray penetrates the tube, it sets off the electrical discharge and you hear a click.

Even away from uranium and other well-known radioactive materials, there is some clicking. Powerful cosmic rays from outer space penetrate the tube and cause clicks. Some materials which are not thought of as radioactive may send out some radiation which can produce some clicking.

But normally, the clicking of the counter is irregular. You can count the clicks in a minute. When radioactive material is brought into the room near a counter, the clicks increase. They become a steady clicking, faster and faster as the material is brought closer. This is the atomic alarm system.

Lights rather than the audible clicks may indicate the counts. When the count is high enough to indicate danger from radiations to persons close to the counter a bell or other sound alarm may go off. Automatic counting devices can be installed to make a record of the rays counted.

Secret "Counting"

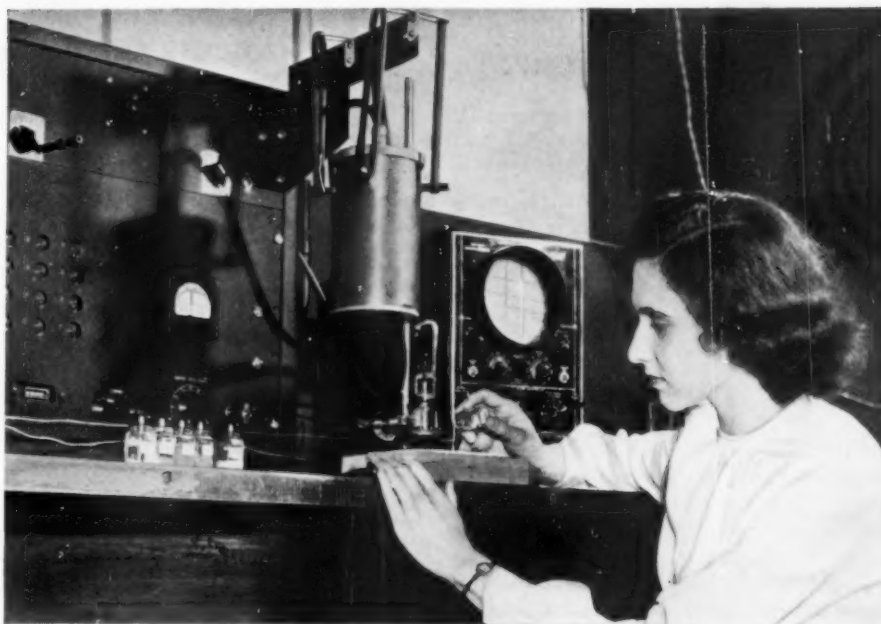
You may be "screened" for radioactivity without knowing it. Counters will probably be installed at some doors. The instrument could be camouflaged. If you walked through the door with a bit of uranium in a bag, the counter might set off a sound alarm system or a visual warning of radioactive material.

You will be "counted" many times for uranium in an age of atomic energy.

Geiger counters are used in nearly every stage of work with radioactive materials. Portable counters can be carried by prospectors searching for the stuff of the atomic bomb. A portable counter which weighs less than five pounds and has its own power from batteries is now on the market.

Science and industry use the counter in work with radioactive materials to help protect the health and lives of workers from the deadly rays.

The dangerous rays of radioactivity can be detected by equipment other than



GEIGER COUNTER—This detector is being used to test for radioactivity in dust gathered after the Bikini aerial explosion last July.

Geiger counters. But the Geiger counter is the most useful sleuth for tracking down the rays of uranium and other radioactive materials.

A practical rival of the Geiger counter for some uses is the electroscope. It can indicate radioactivity and atomic bomb materials though it is rated less sensitive than the counter.

The simplest form of the electroscope has a gold leaf suspended from a vertical rod. When the rod is charged, the leaf stands out at an angle from the rod. As the charge of the leaf leaks away, the leaf swings down against the rod. The rate of swing indicates the conductivity of the air and can warn of the presence of radioactivity.

Electroscopes the shape and size of fountain pens were carried by workers on the atomic bomb project.

There are other detectors, which can warn of radioactivity, but they are chiefly useful to the scientist. He wants to know more than how many rays are counted. Science has other devices for research on how radioactive rays behave and other details from the life of an atom.

But for practical control of atomic energy—for locating uranium being transported illegally or warning of radioactivity attacks—the Geiger counter is our number one atomic sentry.

Science News Letter, June 14, 1947

METALLURGY

Oxygen, Man's Life-Breath, Speeds Steel Production

➤ OXYGEN, life-breath of man, can step up steel production, according to reports of the American Iron and Steel Institute.

The Institute reported that several plants for manufacturing oxygen are now under construction adjacent to steel plants. When the oxygen plants are in production, oxygen will find two important uses in steel production:

1. To increase the heat of the open hearth flame and save between 10% and 25% in fuel costs.

2. For stepping up the rate at which carbon is removed from the liquid metal.

Oxygen enriches the open hearth flame with increases in temperature of up to 500 degrees Fahrenheit. This can reduce the melt-down time as much as 30%.

Bubbling oxygen into the molten bath speeds the reaction which separates the carbon from the metal in liquid form. This can save from 17% to 30% of the time required for the process.

In addition to faster production of steel, better steel may result from the use of oxygen. Some metallurgists have reported better quality steel from the oxygen-enriched processes.

Science News Letter, June 14, 1947

Do You Know?

The *magpie* is a natural thief; shiny objects are preferred by this bird.

Juice from sound oranges only should be used if it is to be preserved by freezing.

Gray-white *feathers* on the bald eagle's head give the appearance of baldness, but the bird is not bald.

Because of a shortage of *iron* scrap used in making steel, iron ore is now being charged into the open hearth to promote chemical reactions.

Soybean oil can now be successfully extracted in a pilot plant by an alcohol extraction process; a commercial plant to use this method is planned.

Furfural, a chemical little known three decades ago but now widely used for many purposes, is made largely today from corn cobs, still a farm waste.



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GENERAL SCIENCE

Physics, Chemistry Lead With Top Young Scientists

► PHYSICS AND CHEMISTRY are the leading choices for major subjects among the brightest science-minded young men and women in this country, as measured by returns on a questionnaire sent to all the contestants in the Science Talent Search conducted by Science Service and the Westinghouse Educational Foundation annually since 1942. Among the 1,800 who have been chosen, (300 each year) as the honors group, a majority favors physics. The balance among the other contestants is slightly in favor of chemistry.

Among the men in the honors group, the physical sciences are definitely favored. This probably has a good deal to do with the total result, since male contestants have consistently been a little more than twice as numerous as female.

Another favored field of choice is medicine. More than 70% of the men who designated this as their choice are now carrying on premedical or medical studies. Young women who indicated the same choice have to a considerable extent decided finally on nursing. Between one-third and one-half of those who were medically minded are in nurses' training schools; less than a tenth are actually heading for the M. D. degree.

Biology, the social sciences and non-science fields have claimed relatively few of the men—only 1% to 4%—but more of the women, with the social sciences as their heaviest choice in this group.

The war, by calling many of the men into armed services, and only a few of the women, has made a really satisfactory comparative study rather difficult. However, the men are back in college now, many of them under the G.I. Bill of Rights, and they are rapidly making up for lost time.

One incidental thing the study disclosed: the brighter the student the more likely he is to answer a questionnaire about himself. A higher percentage of the honors group returned their blanks than of the non-honors group. It must be emphasized, too, that this is not a comparison between bright students and dull ones: practically everyone on the list, non-honors as well as honors, came from the top 20% of their high school graduating classes.

These and other facts about the Science Talent Search "alumni" have come out of a ten-year study that is being conducted by Dr. Harold A. Edgerton of

Ohio State University and Dr. Steuart H. Britt of McCann-Erickson, New York, psychologists who prepare the examinations and assist in the final judging of the contestants.

Science News Letter, June 14, 1947

ORNITHOLOGY

Talkative Raven Is Very Wise Bird

► THE TALKATIVE raven, rather than the taciturn owl, is given credit for being a wise bird by Arthur Cleveland Bent of Taunton, Mass., U. S. National Museum Associate, in a new publication issued by the Smithsonian Institution.

"The raven," says Mr. Bent, "is one of our most sagacious birds—crafty, resourceful, adaptable, and quick to learn and profit by experience."

Impossible to approach ordinarily, the bird makes itself at home around seacoast villages in northern latitudes, where its services as a scavenger are appreciated. From Pennsylvania southward it is a mountain bird, seldom seen below an altitude of 3,000 feet.

It has a considerable vocabulary of calls. Most frequently heard is a hollow laugh: "haw-haw-haw-haw." On the wing it sounds off with loud "crawks", interspersed with occasional more musical notes. It sometimes goes "thung!" like a big tuning-fork, and it also has a metallic, tinkling song resembling that of the red-winged blackbird but much louder. Finally, it can imitate the calls of a number of other birds, such as geese and gulls.

Ravens like to talk to themselves, says Mr. Bent, sometimes keeping it up by the hour. So absorbed do they become in these soliloquies that they often relax their watchfulness, letting an observer approach much closer than they usually permit.

Science News Letter, June 14, 1947

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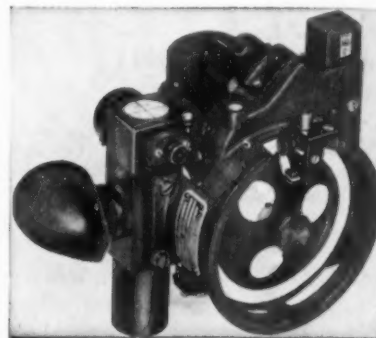
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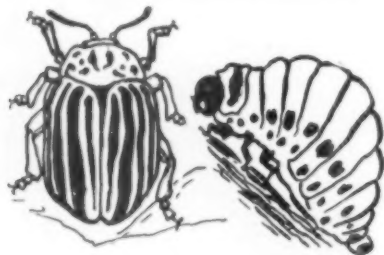
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Feeding the Enemy

► **INSECTS**, it is often asserted and seldom denied, may eventually become the inheritors of the earth, by literally eating man out of house and home. There is no doubt that they are formidable, feeding as they do on everything man produces and uses, from his crops and timber to his clothes and even himself, and serving as carriers of disease as a final lethal filip.

One aspect of the situation, however, is rather frequently overlooked: Most of the really bad insect pests were set up in business by man himself. Under natural conditions, a potential crop plant and its potential devourer are often separated by thousands of miles; it is far-travelling civilized man who brings them together. He also makes things all the easier for the pest by massing its chosen food plant in huge fields, and by devoting whole regions to the intensified production of one crop, like corn in the Midwest or cotton in the South.

As a typical instance, take a look at the striped potato beetle. It used to be a relatively insignificant insect, chewing the foliage of a few weed species related to the potato somewhere in the

Southwest or in northern Mexico. When large-scale potato cultivation reached Colorado it got its real start. It travelled eastward from field to field, and finally reached Europe as a stowaway in shipped potatoes.

The chinch bug, scourge of Midwestern grain fields in dry seasons, offers another case in point. It has always existed where it is now found, feeding undestructively on native grasses, but not until white men began planting hundred-acre grain fields, edge to edge, did it multiply into devastating hordes that sometimes destroy those fields in a single day.

Of course, man does not always bring the crop to the insect. Probably the more usual experience is for him to bring the insect to the crop. The very names of some of our most troublesome insects are monuments to this unhappy fact: Japanese beetles, Hessian fly, European corn-borer, Mexican bean beetle, Argentine ant, Oriental fruit moth—the list is a long one.

Whether man can exterminate the insects is still uncertain. But one thing is sure: if the insects succeed in exterminating man they will have destroyed their best provider.

Science News Letter, June 14, 1947

CHEMISTRY

Flame Cutting and Welding Use Fluorine and Hydrogen

► A WAR-BORN method for cutting and welding metals with flame that uses no oxygen is covered by U. S. patent 2,421,649, assigned by its inventors, H. F. Priest of New York and Dr. A. V. Grosse of Marcus Hook, Pa., to the Office of Scientific Research and Development.

Cutting and welding copper with flame has presented peculiar difficulties, partly because as soon as copper melts it forms oxides that interfere with the work, and even more because of the high thermal conductivity of copper, which carries away the heat before it can make the cut or weld.

The two engineers use a unique combination of gases, fluorine and hydrogen, to get an oxygenless flame of very high temperature—about 4,000 degrees Centigrade. This readily cuts copper. It is also good for welding because of the instant formation of copper fluoride, which serves as a flux, protecting the metal at once against oxidation and the corrosive effects of the fluorine gas itself.

Science News Letter, June 14, 1947

MEDICINE

Few Atom Bomb Survivors Have Serious Injuries

► IF AN atomic bomb were dropped over London, 75,000 people would be killed, 30,000 houses would be completely wrecked, 35,000 would be damaged badly and 50,000 to 100,000 would be damaged to some extent.

By contrast, a 500 pound bomb dropped in the same area would kill six people and a block buster would kill 30.

These figures, which are British estimates, were quoted by Col. James P. Cooney, medical adviser to the director of military application, Atomic Energy Commission, at a symposium at Walter Reed General Hospital in Washington.

Jap survivors of the atomic bombs had very few severe injuries due to mechanical force or flying debris, Col. Cooney reported. This was because the fire which swept both Hiroshima and Nagasaki after the explosions came so fast that no severely injured people could have escaped.

Changes in the color of the skin were striking features of the burns from the atomic bombs. Extreme dark color, like a walnut stain, appeared on those outside a certain range. At Hiroshima this gave a mask-like appearance. But inside this range, the skin lost its color although it was not always scarred.

These factors, Col. Cooney said, suggest that some of the victims were irradiated with ultraviolet light so intense that it completely destroyed the pigment, or color, layer of the skin. Others got only enough ultraviolet to stimulate the pigment layer, giving them a bronze color like a dark suntan.

Science News Letter, June 14, 1947



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ATOMIC CHALLENGE—William Higinbotham and Ernest K. Lindley—*Foreign Policy Assn.*, 68 p., illus., paper, 35 cents. Facts on atomic energy and its control for the layman.

THE BACULA OF SOME FRUIT BATS (PTEROPUS)—D. Dwight Davis—*Chicago Nat. Hist. Museum*, Fieldiana: Zoology, Vol. 31, No. 16, 7 p., paper, 10 cents.

CARE OF THE BREAST—Else K. LaRoe—*Froben*, 215 p., illus., \$3.75. A detailed treatment of the care of this important organ with emphasis on early recognition of symptoms leading to breast cancer.

COLOR ATLAS OF HEMATOLOGY—Roy R. Kracke—*Lippincott*, 204 p., illus., \$5. Brief clinical descriptions of the blood diseases are also incorporated in this atlas for medical students, technicians and doctors.

DESCRIPTION OF PROFESSIONS SERIES—Nat. Roster of Scientific and Specialized Personnel—*Govt. Printing Office*, paper: No. 1, Agricultural and Biological Sciences, 15 cents; No. 2, Engineering Sciences, 15 cents; No. 3, Medical Service Occupations, 5 cents; No. 4, Medical Professions, 10 cents; No. 5, Miscellaneous Professional Fields, 10 cents; No. 6, Physical Sciences, 10 cents; No. 7, Social Sciences, 10 cents.

THE FAMILY DIAECTIDAE AND ITS BEARING ON THE CLASSIFICATION OF REPTILES—Everett Claire Olson—*Chicago Nat. Hist. Museum*, Fieldiana: Geology, Vol. 11, No. 1, 53 p., illus., paper, 60 cents.

GEOGRAPHICAL RACES OF THE RODENT AKODON JELSKII THOMAS—Colin Campbell Sanborn—*Chicago Nat. Hist. Museum*, Fieldiana: Zoology, Vol. 31, No. 17, 9 p., paper, 10 cents.

INSIDE THE UNITED NATIONS: A discussion Guide on Religion and the Peace, Church Peace Union and World Alliance for International Friendship Through the Churches, 42 p., illus., paper, 15 cents. Designed for use by discussion groups, this brochure contains additional references for further reading and plans for programs by groups.

PETROLEUM PRODUCTION, Vol. III: Oil Production by Water—Park J. Jones—*Reinhold*, 268 p., \$5. Deals with convergence, fluid factors, invasion factors, displacement factors, and well interference factors.

THE PSYCHOLOGY OF EGO-INVOLVEMENTS—Muzafer Sherif and Hadley Cantril—*Wiley*, 525 p., \$6. Development of the ego in childhood, its reformation in adolescence, involvements in group and social situations are discussed together with maladjustments, disintegration, and breakdowns of the ego.

REDESCRIPTION OF TAPHROSPHYLS OLSONI, A FOSSIL TURTLE FROM PERU—Ranier Zangerl—*Chicago Nat. Hist. Museum*, Fieldiana: Geology, Vol. 10, No. 5, 39 p., illus., paper, 20 cents.

A SECOND LOOK—Edward H. Faulkner—*Univ. of Okla. Press*, 193 p., \$2. Discussion of the theory of soil impoverishment.

THE SHORTAGE OF PROFESSIONAL WORKERS IN AGRICULTURE AND IN FORESTRY—Committee on Training of Research Workers in Agriculture of the Agriculture Board—*Natl. Res. Council*, Circular 127 20 p., paper, 25 cents.

STEPPING STONES TOWARDS THE FUTURE: Twenty-Seventh Annual Report of the National Bureau of Economic Research—Arthur F. Burns—*Nat. Bur. Econ. Res.*, 91 p., paper, free. A discussion of the long-term economic outlook and seven essay reports by the research staff.

THE STRANGE STORY OF THE QUANTUM—Banesh Hoffman—*Harper*, 239 p., \$3. A popular history of the discovery of the composition of the atom.

TEMPERATURE: Its Measurement and Control in Science and Industry—*Am. Inst. of Physics*, 1362 p., illus., \$12.50. A collection of papers presented at a Symposium under the auspices of the Society with the cooperation of the National Bureau of Standards and the National Research Council.

TIME, KNOWLEDGE, AND THE NEBULAE: An Introduction to the Meanings of Time in Physics, Astronomy, and Philosophy, and the Relativities of Einstein and of Milne—Martin Johnson—*Dover Publ.*, 189 p., \$2.75.

TRACE ELEMENTS IN PLANTS AND ANIMALS—Walter Stiles—*Macmillan*, 189 p., illus., \$2.75. A digest of information on deficiency diseases resulting from lack of micro-nutrients.

Science News Letter, June 14, 1947

London, preparing for a place as the crossroads of airplane routes, is constructing an airport covering seven square miles of area; this is over six times the area of the National Airport serving Washington, D. C.

"If it is desirable that a person shall speak correctly, it is much more desirable that he shall think correctly." —Ballard

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☼ **PHOTOGRAPH FRAME**, which contains fluorescent lighting to illuminate the picture, spreads a soft illumination over the photograph that increases its visibility and brings out the richer tones and beauty in good photographs.

Science News Letter, June 14, 1947

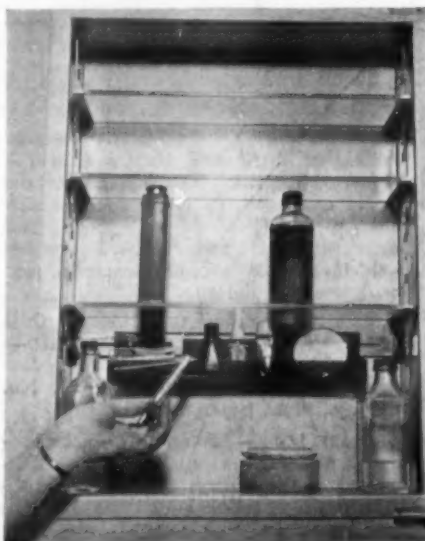
☼ **WATER TURBIDITY** is accurately measured by a naval instrument called a hydrophotometer. It has a meter box above the water and a suspended head submerged at the desired depth. Turbidity, of importance in underwater photography, is determined from electric currents from two photocells in the head actuated by the same light, one directly, the other through 20 inches of water.

Science News Letter, June 14, 1947

☼ **FLASH GUIDE** for photographers provides accurate flash exposure information with the twist of a dial. The cardboard dial in its frame is adjusted so that a code number, representing the film-lamp-shutter combination to be used, is opposite an arrow on the top of the card; then the correct lens opening shows on the bottom.

Science News Letter, June 14, 1947

☼ **REMOVABLE TRAY** to hold toilet articles may be quickly inserted in the ordinary bathroom medicine cabinet. Ex-



tension arms with rubber cushion pads hold it in place when the wingnuts are properly tightened. The tray is of transparent plastic, as shown in the picture.

Science News Letter, June 14, 1947

☼ **RADIO-FREQUENCY** operated edge gluing press, for use in furniture making, generates heat within the product itself, taking minutes for what formerly took hours. Flat plates in the electric circuit on each side of the press develop an electric field between them, thereby

creating heat in the wood cores and drying the glue.

Science News Letter, June 14, 1947

☼ **PORTABLE** mist blower, for insect control work, delivers extremely small amounts of concentrated insecticides on 35-foot trees in the form of a finely atomized spray. Atomization is accomplished by a large volume of air at high velocity coming through a tubular tunnel from a powerful fan.

Science News Letter, June 14, 1947

☼ **CIRCULATOR** for bottles in refrigerators is a wire basket without a front, but with a partial partition in the center and a series of rollers on its curved rear. When a fresh bottle of milk is inserted on one side of the partition and pushed, the rollers help bring older bottles to the front on the other side.

Science News Letter, June 14, 1947

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